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Research Article

## Causes of maternal deaths at Tezpur medical college & hospital, Tezpur, Assam, India: a retrospective study

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### ABSTRACT

**Background:** The present study was undertaken to find out the causes of maternal deaths in O&G Department, TMCH, Tezpur, Assam.

**Methods:** Data for the study was collected from all maternal deaths, in patients attending both OPD as well as Emergency, occurred from March '2014 to February '2016 at TMCH, Tezpur.

**Results:** Out of total 52 maternal deaths; 28.85% are due to anaemia, 25% are due to Haemorrhage, 19.23% are due to Toxaemia. Obstructed labor and sepsis accounts for 9.61% of maternal deaths, each; unsafe abortion and other categories accounts for 3.84 % of maternal deaths, each. Out of total maternal deaths, 86.5 % belonged to rural areas, 21.2% are unbooked cases, 73.1% are poor literates and 67.3% are from poor socioeconomic groups. Out of 52 deaths, 50 cases died within 24 hrs.

**Conclusions:** In our study it is observed that anaemia, haemorrhage and toxaemia are the three major causes of maternal deaths in TMCH, Tezpur. Obstructed labour, sepsis, unsafe abortions, etc. are the causes of the rest of the maternal deaths. It is seen from the study that illiteracy, ignorance, unawareness, poor socioeconomic conditions, lack of antenatal checkups, non-availability of quality care set ups, and drawbacks in referral systems were the major causative factors.

**Keywords:** Maternal deaths, Haemorrhage, Tertiary care

### INTRODUCTION

Maternal mortality is an important health indicator for any country. In India maternal mortality is still having a very high rate, i.e., 167 per Lakh live births (SRS 2011-2013), in comparison to 9 per Lakh in developed countries.<sup>1</sup>

Causes of maternal deaths are found to be different among countries. In developed countries major causes of maternal deaths are hypertensive disorders, haemorrhage and embolism. On the other hand, in developing countries major causes of maternal deaths are anaemia, haemorrhage, hypertensive disorders and sepsis.<sup>2</sup>

In India itself, different causes of maternal deaths are found in different regions. In northern India sepsis is the leading cause followed by haemorrhage, hypertensive disorders and anaemia. In southern India, haemorrhage is the leading cause followed by hypertensive disorders, sepsis and anaemia. In north-east India hypertensive disorders are the leading cause followed by haemorrhage, sepsis and anaemia.<sup>1</sup> In Assam, the MMR is higher than the national rate, i.e. 300/Lakh live births.<sup>1</sup> The MMR of Assam is highest among all the states. The aim of the study is to find out the causes of maternal deaths occurring in TMCH; Tezpur, from different communities, religions and socioeconomic conditions.

## METHODS

Data was collected for this retrospective study from all the maternal deaths that occurred from March '2014 to Feb. '2016 at TMCH, Tezpur, in patients attending both OPD as well as Emergency.

### Inclusion criteria

1. Deaths resulting from complication of pregnancy itself, labour, during puerperium or within 42 days of termination of pregnancy, irrespective of site and duration of pregnancy. 2. Deaths resulting from disease present before or developed during pregnancy that was obviously aggravated by the pregnancy itself.

### Exclusion criteria

1. Deaths from Accidents, Poisoning, Physical assault.

Method of collection of data was: 1. Information obtained from the Patient's bed head tickets. 2. Information obtained from the patient's relative and from the ASHA concerned. Data were thus collected and analysed.

## RESULTS

In our study, the total live births were 11,210 in the given period out of which total maternal deaths were 52. Out of total 52 maternal deaths; 28.85% are due to anaemia, 25% are due to Haemorrhage, 19.23% are due to Toxaemia. Obstructed labour and sepsis accounts for 9.61% of maternal deaths, each; unsafe abortion and other categories accounts for 3.84 % of maternal deaths, each. Out of 52 maternal deaths, 48 cases are from rural areas (92.31%) and 4 cases from the urban areas (7.69%).

In our study, most of the maternal deaths are from the age group of more than 20 years (69.2%). More maternal deaths were found from the groups attended primary school or below (73.1%).

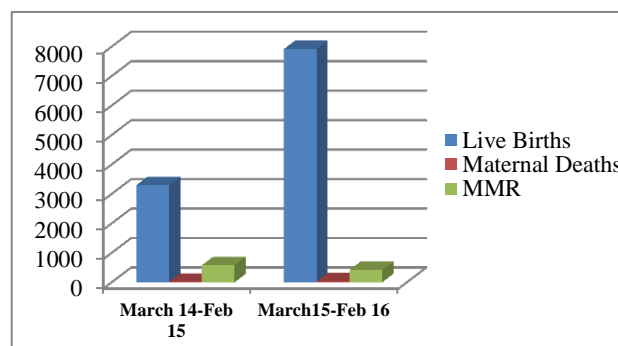
Study groups having a family income of <15,000/month were found to have more maternal deaths (Table 1). In the study more maternal deaths are encountered in the groups having no or irregular antenatal check-ups (21.2%).

The quality of the referral system of the complicated pregnancy cases to TMCH from the periphery areas also affected to a great extent in the causation of the maternal deaths. Out of 52 cases, 22 cases were referred to TMCH with strong maternal complications (42.3%) at admission.

In the study, out of 52 deaths 17 maternal deaths occurred within a time period of < 4 hrs. (32.6%) and 33 maternal deaths were found in between 4-24 hrs (63.5%).

**Table 1: Different features of study group.**

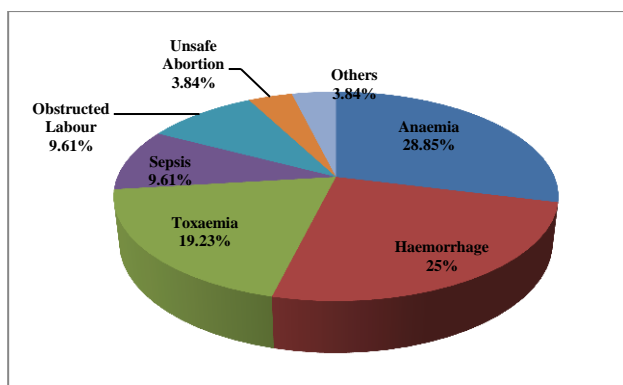
Categories	Number	%
Total no. of maternal deaths	52	
Total no. of live births	11,210	
Residence	Rural	45 86.5
	Urban	7 13.5
Age	20 yrs or below	16 30.8
	> 20 yrs	36 69.2
Educational Status	Primary school or below	38 73.1
	High School or above	14 26.9
Family Income	< 15,000/month	35 67.3
	>= 15,000/month	17 32.6
ANC received	No ANC	11 21.2
	< 3 ANC	28 53.8
	3 or more ANC	13 25
Referral	Referred	22 42.3
	Direct admission	30 57.7
Parity	Primi	34 65.4
	Multi	28 53.8
Admission to death interval	< 4 hrs	17 32.6
	4-24 hrs	33 63.5
	1-7 days	2 3.8



**Figure 1: Histogram showing yearly distribution of maternal deaths in TMCH, Tezpur (from March 2014 to Feb 2015 & March 2015 to Feb 2016).**

**Table 2: Disease-wise distribution of maternal deaths in TMCH.**

Causes of maternal deaths	No. of deaths	%
Anaemia	15	28.85
Haemorrhage	13	25
Toxaemia	10	19.23
Obstructed labour	5	9.61
Sepsis	5	9.61
Unsafe abortion	2	3.84
Others	2	3.84
Total	52	



**Figure 2: Pie diagram showing causes of maternal mortality in TMCH.**

### DISCUSSION

In the present study we found that the maternal mortalities in TMCH are mainly due to anaemia, haemorrhage, toxaemia, obstructed labour and sepsis. We found total maternal death in the said period is 52 in a total live birth of 11,210. Thus the MMR is 464. The MMR in Assam is 300 [SRS 2011-2013] and MMR in India is 167 [SRS 2011-2013].

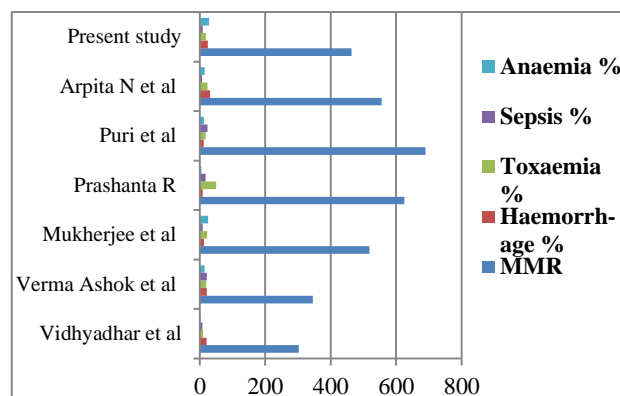
TMCH being a rural tertiary referral centre is thus having a high MMR. More higher MMRs were found by Goswami et al from Guwahati Medical College & Hospital in 1994, S. K. Bera, et al from Kolkata in 1990, Sharmishta et al from Silchar in 1995 and Shanti Roy, et al from Patna in 1998, showing MMRs of 1234/Lakh live births, 1023/Lakh live births, 2089/Lakh live births and 2667/Lakh live births, respectively.<sup>3-6</sup> However, K. Pratima, et al from Manipur in 2012 found an MMR of 90.45/Lakh live births; which is much lower than our study.<sup>7</sup>

In the study, we found most common cause of maternal deaths in TMCH is due to Anaemia (28.85%) which is multifactorial in origin. Mukherjee et al in 1996-2006 and Verma Ashok, et al in 1995-2005 found a similar result of 25.40% and 15.40 %, respectively.<sup>8,9</sup> Anaemia is the leading cause of maternal deaths occurring in TMCH because of multiple factors which includes poor

socioeconomic conditions, malnutrition, irregular ANC's, repeated child births with inadequate spacing and poor literacy rates.

Next to it, Haemorrhage is the major cause (25%) of maternal deaths. Arpita N et al in 2006-2010 and Vidhyadhar et al in 2006-2010 found 31.9 % and 21.05 %, respectively.<sup>10,11</sup> In TMCH the high rates of Haemorrhage related maternal deaths are due to late detection and inability to reach TMCH at proper time from the referring centre for proper intervention. Patients with pre-existing anaemia along with haemorrhage leads to more maternal deaths. Haemorrhagic causes of maternal deaths include deaths resulting from APH, PPH, Ectopic pregnancy, Incomplete Abortions and Ruptured Uterus.

Toxaemia is the third common cause of maternal deaths (19.23%). Verma Ashok, et al in 1995-2005 and Puri, et al in 2003-2006 found a similar result of 20% and 18% of maternal deaths due to toxaemia, respectively.<sup>9,12</sup> This is mainly due to irregular ANC's and lack of compliance to treatment in the patient's study group. Obstructed labour (9.61%), Sepsis (9.61%), Unsafe Abortion (3.84%) and others (3.84%) comes in magnitude as causes leading to maternal deaths in TMCH, Tezpur. Maternal deaths due to obstructed labour in our study are mainly due to late referral of patients from periphery to TMCH.



**Figure 3: Bar Diagram showing comparative analysis of maternal death causes.**

**Table 3: Comparative analysis.**

Authors	MMR	Haemorrhage %	Toxaemia %	Sepsis %	Anaemia %
Mukherjee et al 1996-2006, <sup>8</sup>	518.7	12.7	22.97	9.45	25.40
Verma Ashok et al 1995-2005, <sup>9</sup>	345.9	21.8	20	21.6	15.4
Arpita N et al 2006-2010, <sup>10</sup>	555.5	31.9	24.2	7.24	14.95
Vidhyadhar et al 2006-2010, <sup>11</sup>	302.6	21.05	10.25	7.89	2.63
Puri et al 2003-2006, <sup>12</sup>	690	12	18	24	13
Prashanta R 2005, <sup>13</sup>	625	9.22	50.56	18.17	4.8
Present study	463.9	25	19.23	9.61	28.85

## CONCLUSIONS

From our study, it is found that anaemia is the major cause of maternal deaths. This is accounted to the fact that TMCH, Tezpur is a rural tertiary referral centre, where most of the patients are coming from the rural areas with poor nutrition, lack of awareness, poor education, inadequate birth spacing and irregular ANC's. Most importantly, well equipped referring and transporting systems are lagging behind. Early detection of PIH and its proper management can reduce maternal deaths due to toxemia. Haemorrhage especially during post-partum period is sudden and unpredictable and is more dangerous when women are having pre-existing anaemia. Higher prevalence of anaemia and non-availability of blood in blood bank were the important factors in deaths from haemorrhage. Active management of third stage of labour can prevent many of these deaths. Sepsis is probably the most easily preventable cause of maternal deaths. Practice of proper asepsis and antiseptic care during delivery with reasonable use of antibiotics can prevent maternal deaths from sepsis. Regular ANC's and active participation of ASHAs and other health/social workers can reduce the burden of maternal deaths to a great extent.

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